and ample apparatus for teaching the various subjects in which instruction is given. Although the regular school exercises were begun only in February 1884, the total number of pupils enrolled is now 190.

In his Report for 1886, Mr. Andrew S. Draper, Superintendent of Public Instruction in the State of New York, points out that that State is now spending 14,000,000 dollars annually in support of its public school system; and he suggests that it might be well to spend a few thousands occasionally in efforts to determine the best way of using this vast sum. Mr. Draper puts some questions which show that he is far from being perfectly satisfied with the educational system he has to administer. "Is there not," he asks, "too much French, and German, and Latin, and Greek, and too little spelling, and writing, and mental arithmetic, and English grammar, being taught? Have we been as ambitious of progress in the lower grades as in the advanced? Are not our courses of study too complex? Are we not undertaking to do more than we are doing well? Is not the examination business being overdone? Are we not cramming with facts, which will soon be forgotten, rather than instilling principles which will endure?"

In an article in the March number of the *Zoologist*, Mr. Robert Service tries to show that, until near the end of the first quarter of the present century, ptarmigan were natives of the south-west of Scotland. He thinks that when these birds were on the mountains of Dumfriesshire and Galloway they were probably also to be found on the Cumbrian Mountains. Mr. Service says that, in nearly all the outlying stations of the present race of ptarmigan in Scotland, such as Arran, Argyll, and the Outer Hebrides, they are decreasing.

Mr. William Burgess, who owns an extensive pheasantry at Malvern Wells, has recently made some observations upon the red worm, which is one of the worst assailants of birds. He thinks it comes from the droppings of cattle, which when young are especially liable to the attacks of this insect. Mr. Burgess finds that agricultural salt acts as a remedy against it.

A discovery of great geological interest was lately made on Juckatoo Island, Sydney, in the shape of a Mastodonsaurus. There is a similar specimen from Stuttgart in the collection of the University, but this one is remarkable from the fact that it is the first Labyrinthodont found in Australia. It belongs to the Triassic age of the Hawkesbury Sandstone formation.

Dr. Weill, of Paris, having carefully studied the new therapeutical agent, antifebrine, or acetanilide, discovered by Cohn and Hepp, of Strasburg, says that it is an anæsthetic agent, and that it combats fever very effectually.

A French translation of the "Phantasms of the Living" is being prepared in Paris by M. Ch. Richet and some other persons.

M. Hayez, of Brussels, has issued a second edition of "A General List of Observatories and Astronomers, and of Astronomical Societies and Reviews," prepared by M. A. Lancaster, Librarian of the Royal Observatory of Brussels. The List has been drawn up with great care, and, from the fact that a second edition has been called for, we may assume that astronomers have found it of considerable service. The names and addresses of all well-known astronomers are given, and the compiler has noted every Observatory, whether public or private, in which work is actually being done.

In the Proceedings of the U.S. National Museum, lately issued, there is a paper by Mr. G. H. Boehmer, on Norse naval architecture. Mr. Boehmer gives a clear and remarkably interesting account of the forms of boats represented in the ancient rock-sculptures of Sweden and Norway; of the boat-shaped stone burial-groups supposed to have been erected during the transition time from the Bronze period to the Iron Age; and of boat-remains dating from the third to about the ninth or tenth century of our era, and found at various times and places. The ship found at Tune, and the Gokstad ship, are carefully described. Mr. Boehmer thinks that the "Northland boats" now used in the fisheries along the coast of Norway are almost exactly like those which have always been used by Norsemen from the time of the rock-sculptures. These Northland boats are described as long, narrow, and low, light and elegant, and fit both for sailing and rowing.

The additions to the Zoological Society's Gardens during the past week include a Black-winged Kite (*Elanus cæruleus*) from the Cape of Good Hope, presented by Mr. R. Southey; a Hawfinch (*Coccothraustes vulgaris*), British, presented by Mr. W. H. Quintin; two Pike (*Esox lucius*) from British fresh waters, presented respectively by Mr. H. E. Young and Mr. G. G. Sykes; two Gloved Wallabys (*Halmaturus manicatus* ♂ ♀), two Cereopsis Geese (*Cereopsis novæ-hollandiæ*) from Australia, a Blossom-headed Parrakeet (*Palæornis cyanocephalus*) from India, received in exchange; two Pike (*Esox lucius*) from British fresh waters, purchased.

OUR ASTRONOMICAL COLUMN

Solar Activity in 1886.—The latter part of 1886 showed a most remarkable falling off in the number and size of the sun-spots, a falling off so great as to lead so experienced an observer as Prof. Tacchini to speak of it as possibly the minimum of the eleven-year period. The following numbers, taken from Prof. Tacchini's tables (*Comptes rendus*, vol. ciii. No. 2, and civ. No. 4), may be compared with those we gave (Nature, vol. xxxiii. p. 398) for the year 1885:—

	Relative frequence	Relative size of spots	Daily number of spot groups	Relative size of faculæ
January	8·84	60·42	2·00	47·63
February	6·30	29·00	1·70	32·10
March	14·39	84·78	3·87	43·91
April	8·13	51·91	3·00	41·32
May	6·50	52·77	1·92	37·81
June	7·14	25·22	2·32	37·14
July	8·30	39·93	2·17	35·42
August	3·24	18·70	1·40	8·33
September	5·59	23·41	1·45	18·52
October	1·46	8·08	0·69	18·08
November	0·04	0·15	0·04	7·41
December	6·17	27·04	1·22	15·65

After the fine group of spots which were seen on May 7 and 8 had passed out of sight, the spots decreased in number and size pretty steadily until the end of October. From October 31 to December 12 there then ensued a long period of almost total quiescence. On six days only out of the forty-two could there be discovered on the sun any trace even of a spot, and on those days only one tiny spot could be seen. For an entire rotation and a half the sun was practically free from spots. M. Riccò has also drawn attention to this remarkable interval, and on searching the Palermo records for the earliest comparable period after the maximum of 1870, he finds a somewhat similar interval of quiescence in 1875, five years after the maximum of 1870, and nearly eight years after the minimum of 1867. The depression of last November follows the maximum of 1884 by less than three years, but the previous minimum by about eight years; reckoning from the minimum, the November depression follows the precedent of 1875, but reckoning from the maximum, it would appear to have occurred most exceptionally early. It would seem, therefore, that the irregularity has not been so much in the principal or secondary minima as in the maximum of 1884, which fell later than the mean by nearly two years. M. Riccò anticipates that the true minimum of the eleven-year period will fall in 1890.

A striking feature of the past year has been the great diminution, and for some months, the almost total cessation of spot activity in the northern hemisphere of the sun, nearly all the principal groups having been located in the southern hemisphere.

Faculæ and prominences have shown a falling off in 1886, but

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one far less marked than that shown by the spots. The following numbers derived from notes by the Rev. S. J. Perry in the *Observatory* for February 1886, and March 1887, shows that the mean extent of the prominence arc has greatly diminished, though the mean height of the prominences has suffered little change. This diminution in extent was especially marked during the last three months of the year.

	Mean height of chromosphere, excluding prominences	Mean height of prominences	Mean extent of prominence arc
	″	″	° ′
1885	8·00	28·67	28 25
1886	8·05	24·78	13 36
Mean 1880 to 1885 ...	8·07	25·71	32 45

The "mean extent" for October is 9° 54′, for November 7° 25′, and for December 9° 31′.

COMET 1887 *d* (BARNARD, FEBRUARY 15).—Prof. Boss has furnished other elements of this comet than those he gave in his first circular, the first set of elements being thus superseded. They are as follows:—

$$T = 1887 \text{ March } 28{\cdot}47$$

$$\left.\begin{aligned} \omega &= 36^\circ\ 37' \\ \Omega &= 135\ \ 28 \\ \iota &= 139\ \ 45 \end{aligned}\right\} \text{Mean Eq. } 1887{\cdot}0$$

$$\log q = 1{\cdot}0059$$

Prof. Krueger (*Astr. Nach.*, No. 2774) has computed the following ephemeris for Greenwich midnight from these elements:—

1887	R.A.	Decl.	log r	log Δ
	° ′	° ′		
March 13 ...	54 13	57 49 N.	0·0162	9·9430
15 ...	52 53	57 11	0·0129	9·9730
17 ...	51 44	56 39	0·0100	0·0008
19 ...	50 41	56 11	0·0076	0·0265
21 ...	49 46	55 46	0·0056	0·0400

THE WARNER OBSERVATORY.—Mr. Lewis Swift, director of the private observatory of Mr. Warner, of Rochester, N.Y., has recently published a pamphlet giving a description of the dome and 16-inch refractor and other accessories of the observatory. The great telescope has been used by Mr. Swift, since July 1883, in a systematic search for new nebulæ, of which 540 have been discovered up to January 1, 1887. The places and descriptions of over 400 of them are given. Mr. Swift is also engaged in searching for comets. The pamphlet, in addition, contains a list of the recipients of the Warner Prizes for cometary and other astronomical discoveries, as well as a reprint of the essays on comets and on the "sky-glows" of 1883 and 1884, to which prizes have been adjudged.

ASTRONOMICAL PHENOMENA FOR THE WEEK 1887 MARCH 13–19

(FOR the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24, is here employed.)

At Greenwich on March 13

Sun rises, 6h. 21m.; souths, 12h. 9m. 39·3s.; sets, 17h. 58m.; decl. on meridian, 2° 56′ S.: Sidereal Time at Sunset, 5h. 22m.

Moon (at Last Quarter March 16) rises, 21h. 43m.*; souths, 3h. 8m.; sets, 8h. 23m.; decl. on meridian, 9° 34′ S.

Planet	Rises	Souths	Sets	Decl. on meridian
	h. m.	h. m.	h. m.	° ′
Mercury ...	6 22	12 54	19 26	5 33 N.
Venus ...	7 6	13 39	20 12	5 52 N.
Mars ...	6 41	12 46	18 51	0 15 N.
Jupiter...	21 49*	2 52	7 55	11 53 S.
Saturn...	11 34	19 43	3 52*	22 29 N.

* Indicates that the rising is that of the preceding evening and the setting that of the following morning.

Occultation of Star by the Moon (visible at Greenwich)

March	Star	Mag.	Disap.	Reap.	Corresponding angles from vertex to right for inverted image
			h. m.	h. m.	° °
14 ...	γ Libræ ...	4½	3 56	5 10	82 252

March	h.	
17 ...	14 ...	Saturn stationary.

Variable Stars

Star	R.A.	Decl.			
	h. m.	° ′		h. m.	
η Geminorum ...	6 8·1	22 32 N.	Mar. 15,	0 0	*M*
R Lyncis ...	6 51·9	55 29 N.	„ 18,		*M*
R Crateris ...	10 55·0	17 43 S.	„ 19,		*M*
δ Libræ ...	14 54·9	8 4 S.	„ 16,	23 13	*m*
U Coronæ ...	15 13·6	32 4 N.	„ 17,	3 18	*m*
U Ophiuchi...	17 10·8	1 20 N.	„ 13,	2 40	*m*
		and at intervals of		20 8	
W Sagittarii ...	17 57·8	29 35 S.	Mar. 13,	22 0	*M*
U Sagittarii...	18 25·2	19 12 S.	„ 15,	21 0	*m*
R Sagittæ ...	20 8·9	16 23 N.	„ 19,		*m*
U Capricorni ...	20 41·9	15 12 S.	„ 16,		*M*
R Vulpeculæ ...	20 59·4	23 22 N.	„ 19,		*M*
δ Cephei ...	22 25·0	57 50 N.	„ 18,	11 0	*M*

M signifies maximum; *m* minimum.

Meteor-Showers

	R.A.	Decl.	
Near α Persei	50°	48° N.	
β Virginis... ...	175	10 N.	Slow bright meteors.
δ Ursæ Majoris..	185	58 N.	March 17.
β Draconis ...	263	50 N.	
η Serpentis ...	276	6 N.	Very swift meteors.
κ Cephei	300	80 N.	Slow bright meteors.

GEOGRAPHICAL NOTES

ON Tuesday last, the 8th inst., the Expedition under Mr. H. M. Stanley for the relief of Emin Pasha, arrived at Simonstown from Zanzibar. They were to resume their voyage on Wednesday, after taking supplies on board. Mr. Stanley is accompanied by Tippoo Tip, through whose agency, it is expected, Stanley Falls will be restored to the Congo State. Messengers have been sent across the continent to the Congo, and Mr. Stanley expects that a large addition to his caravan will be awaiting him when he arrives on the Upper Congo.

LIEUT. BAERT, of the Congo Free State, has recently made a journey up the Mongalla, a northern tributary of the Congo, considerably to the east of the Mobangi. The river had previously been navigated to some extent by Mr. Grenfell, but Lieut. Baert has succeeded in getting much beyond Grenfell's furthest. In fact, he attained the limit of navigation, at over 200 miles from the mouth of the river, where its course is broken by falls. The river flows in a general southward direction, through a well-wooded country, and its rapids are situated in about 3° 30′ N. lat., and 22° E. long. The Mongalla is very sinuous; its rapids are situated in a mountainous district inhabited by a people named Sebi, who do good work in iron.

A FRENCH traveller, M. Chaffanjon, is exploring the Orinoco. He has already surveyed the Bolivar and the San Fernando, and discovered numerous errors in existing maps. He has made large collections in ethnology, archæology, and philology. He hoped to solve the puzzling problem of the Casiquiare, and reach the sources of the Orinoco last December.

IN the first number for 1887 of the *Mitteilungen* of the Vienna Geographical Society, is a German translation of the interesting paper by D. Isabelo de los Reyes, on the Tinguians of the Philippine Island, Luzon. The author is himself an Ilocan, a tribe which marches with the Tinguians, and has had exceptional opportunities of investigating the origin, and customs, and beliefs of his fellow-countrymen, and, being educated, can tell what he knows. A good map accompanies the paper, and to this Dr. Blumentritt contributes explanatory text. To the same number Herr Edward Glaser contributes a sketch of his journeys in South Arabia, which, while mainly for archæological purposes, have yet been the means of adding much to our knowledge of the little-known South Arabian mountain-land.

THE *Bollettino* of the Italian Geographical Society for January publishes a detailed account of the recently acquired Italian possessions on the Red Sea coast, extracted from an official memoir presented to the Chamber of Deputies by S. E. di Robilant. These possessions are grouped under three separate divisions: (1) territory garrisoned and administered by Italy, including Massowa, Emberemi, the Abd-el-Kader peninsula, Gherar, Taulud Island, and the neighbouring Dahlak Archipelago; (2) protected territory, comprising the

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